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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

UMEZ ERONINI, LYNETTE T

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1765

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

10/023,948

Applicant(s)

LEE ET AL.

Examiner

Lynette T. Umez-Eronini

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/7/2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 13-20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. (US 5,607,718) in view of Miyashita et al. (US 6,354,941 B1).

Sasaki teaches, "... the slurry prepared by dispersing silica particles (same as applicant's abrasive) in an aqueous pH 11 piperazine solution was used as the polishing agent. However, it is also possible to use amines (same as applicant's pH

controlling agent) such as . . . choline (same as applicant's choline derivative), . . . as the alkali solution for adjusting the pH (column 22, lines 39-45), which reads on,

a polishing slurry, comprising: an abrasive; deionized water; and a pH controlling agent, **as in claims 1, 3, 4, 8, 9, and 10**; and

a choline derivative such as choline chloride, which is a species that encompasses a generic choline compound, **as in the present claims 5 and 6**. Since Sasaki's slurry contains choline as in the claimed invention, then using Sasaki's choline in the same manner as the claimed invention would result in a choline derivative that causes the removal rate of the silicon oxide layer to be greater than the removal rate of the silicon nitride layer, as in claim 3.

Sasaki differs in failing to teach polyethylene imine, which reduces respective removal rates of the silicon oxide layer and the silicon nitride layer, and which has a molecular structure of $[-CH_2CH_2N(CH_2CH_2NH_2)-]_x[-CH_2CH_2NH_2-]_y$, where x and y are positive integers, **in claim 1**; where x and y may have a value of zero, **in claim 11**; and the polyethylene imine comprises more than 0.02 wt % of the polishing slurry, **in claims 2 and 7**.

Miyashita teaches a polishing agent (column 5, lines 4-9) that includes a water-soluble amine. "The typical examples of the water-soluble amine used in the present invention include, . . . polyethylene imine . . . (column 7, lines 48-53). "The amount of the water-soluble amine is not particularly limited, as far as the performance of the polishing agent can be maintained. Generally, the amine amount is selected appropriately from within a range of 0.1 to 20% by weight (which encompasses

Art Unit: 1765

applicant's polyimine comprising more than 0.02 wt % or the polishing slurry in the present claims 2 and 7) so as to achieve a desired pH value, i.e., 8 to 11, of the polishing agent in the polishing step" (column 7, lines 58-63). Using Miyashita's polyethylene imine, which is the same composition that is used in a polishing solution of the present invention, would result in the polyethylene imine having a molecular structure of $[-H_2CH_3N(CH_2CH_2NH_2)-]_x[-CH_2CH_2NH_2-]_y$, where x and y are positive integers and encompasses the polyethylene imine comprising more than 0.02 wt % of the polishing slurry as claimed in the present invention. Also using Miyashita's polyethylene imine in the same manner as that of the claimed invention would inherently result to reduce respective removal rates of the silicon oxide layer and the silicon nitride layer.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Sasaki by using Miyashita's polyethylene imine in a polishing slurry for the purpose of having a water-soluble amine that has a weak basicity that tends to be excellent in preservation capability and polishing function when used in a polishing agent (Miyashita, column 7, lines 65-67).

In claim 1, no patentable weight is given to the phrase, "which simultaneously removes a polysilicon layer, a silicon oxide layer and a silicon nitride layer," which is functional language that shows intended use. Likewise the intended use of composition is not patentably significant. *In re Albertson* 141 USPQ 730 (CCPA 1964); *In re Heck* 114 USPQ 161 (CCPA 1957).

Art Unit: 1765

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki ('718) in view of Miyashita ('913 B1) applied to claim 1 above, and further in view of Kimura (US 5,869,392).

Sasaki in view of Miyashita differs in failing to specify the choline derivative comprises 1.3 wt % of the polishing slurry.

Kimura teaches, "... In the CMP process, chemical polishing variables include the kind, pH, and composition of solvent; and mechanical polishing variables include the kind and concentration of slurry ... (column 4, lines 11-16), which provides evidence that the concentration of a polishing slurry is a so-called "result effective variable."

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Sasaki in view of Miyashita by using Kimura as evidence that the concentration of slurry is a so-called "result effective variable" since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

5. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703-305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

ltue

August 15, 2003

NADINE G. NORTON
PRIMARY EXAMINER
